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FEB 1 1911

Issued January 31, 1911.

United States Department of Agriculture,

BUREAU OF CHEMISTRY—CIRCULAR No. 66.

H. W. WILEY, Chief of Bureau.

EXTRACTS FROM THE PROCEEDINGS OF THE ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS, 1910.[1]

REPORTS ON THE RECOMMENDATIONS OF REFEREES.

COMMITTEE A.—J. K. HAYWOOD, CHAIRMAN.

(Nitrogen, potash, phosphoric acid, soils, inorganic plant constituents, insecticides, and water.)

NITROGEN.

It is recommended—

(1) That the next referee on nitrogen be requested to study laboratory methods for the determination of the availability of organic nitrogen.

Adopted.

POTASH.

It is recommended—

(1) That a study be made of the volumetric (Bul. 132, p. 21)[2] and gravimetric cobalti-nitrite methods for another year.

Adopted.

(In the case of the gravimetric cobalti-nitrite method, precipitate as in the volumetric method, filter through a Gooch crucible, wash thoroughly with water, and finally four or five times with 80 per cent alcohol. Dry at least one hour at 100° C., and weigh. Multiply by the factor 0.2075.)

(2) That a further trial be made of the modification of the official method by washing a weighed amount of the sample through filter paper with hot water and determining potash in the filtrate.

Adopted.

SOILS.

It is recommended—

(1) That the referee on soils for 1911 be instructed to investigate the subject of a more accurate method for humus determinations.

Adopted.

(2) That the modified cobalti-nitrite method for total potash in soils be further studied.

Adopted as reported by the committee (the referee recommended adoption as an optional official method). See J. Ind. Eng. Chem., 1909, 1:302; also Bul. 132, pp. 29–30 and pp. 38–42, for the discussion of the Drushel modification of the cobalti-nitrite method in connection with the Smith fusion.

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[1] An advance circular giving the recommendations of referees as adopted and other action affecting the work of 1911, together with the officers, referees, and committees appointed.

[2] All bulletin references are to Bureau of Chemistry series, U. S. Department of Agriculture.

(3) That the study of methods for the quantitative estimation of soil acidity be continued.

Adopted.

Mr. Shedd recommended that the official method for manganese in soils as given on page 15 of Bulletin 107, Revised, be reworded to read as follows:

Concentrate solution B to about 50 cc, cool, add bromin water until the solution is colored, make alkaline with ammonium hydroxid, and heat to boiling in a covered beaker * * *

The change insures an ammoniacal solution during boiling, which is necessary to bring down manganese, and as only a correction in wording is involved which does not constitute any alteration in the method, the chairman of the revision committee authorizes the insertion of the suggested reading.

INORGANIC PLANT CONSTITUENTS.

It is recommended—

(1) That the peroxid method for sulphur in plants be made official. (Bul. 107, Rev., p. 23.)

Adopted.

(2) That the work on the determination of ferric and aluminic oxids be continued another year.

Adopted.

(This recommendation as received from the committee replaced the two made by the referee to the effect that the method for ferric and aluminic oxids be made provisional and that another method be sought for these determinations and that cooperative work be done on a synthetic ash solution if such a method be found.)

INSECTICIDES.

It is recommended—

(1) That the provisional method for total arsenic oxid in lead arsenate be adopted as official. (Bul. 107, Rev., p. 239.)

Adopted, having been referred from the previous year for final action.

(2) That a further study be made of methods for the determination of total lead oxid in lead arsenate, particularly the chromate method as proposed by the present referee.

Adopted.

A brief statement of the chromate method is as follows:

Treat 2 grams of the sample with 50 cc of nitric acid (1:4), heat the solution, filter if an insoluble residue remains, wash and make to 200 cc. Pipette 50 cc of this solution into a 400 cc beaker, dilute to at least 300 cc, heat nearly to boiling, add sodium or ammonium hydroxid to incipient precipitation, then dilute nitric acid (1:10) to redissolve the precipitate, avoiding more than a slight excess; then add to this boiling solution 50 cc of a 10 per cent potassium chromate solution heated nearly to boiling, stir thoroughly during the addition, let stand on the steam bath for from twenty to thirty minutes and filter hot. Collect the precipitate in a weighed gooch, wash with boiling water, and dry in an air oven at from 140° to 150° C. to constant weight.

(3) That the method for soluble arsenic in lead arsenate be further studied as regards time of standing for the solution of soluble arsenic. (Bul. 107, Rev., p. 240.)

Adopted.

(4) That Method I for total arsenious oxid in London purple as given in Bulletin 107, Revised, page 28, be adopted as official.

Recommendation adopted and referred to the association for final action in 1911.

(5) That Method III as proposed by the referee in 1909 (see Bul. 132, p. 43) for total arsenic oxid in London purple, be adopted as official and designated as Method II.

Recommendation adopted and referred to the association for final action in 1911.

(6) That the Gatehouse method[1] for the determination of chlorin in cyanids be adopted as official.

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[1] Sutton's Volumetric Analysis, 9th ed., p. 201; Bureau of Chemistry Circular 10, Rev., p. 6.

Recommendation adopted and referred to association for final action in 1911.

(7) That the provisional method for the analysis of lead arsenate (Bul. 107, Rev., p. 239) be changed as follows:

For paragraphs (*a*) and (*b*) on "Preparation of sample" and on "Moisture," respectively, substitute sections suggested in referee's report, and add methods proposed for the determination of free acetic acid and of free ammonia.

These additions and changes which were all adopted as provisional, read as follows:

(*a*) PREPARATION OF SAMPLE.

In case the sample is in the form of a paste mix it thoroughly and remove therefrom a sufficient amount to make a quantitative determination of free acetic acid or ammonia, if either is present; transfer this portion to a bottle and stopper tightly until ready for its analysis. Dry the whole of the remainder, if a pound or less, at from 80° to 100° C. until dry enough to powder readily, without sticking, and obtain loss in weight. If the original sample is larger than 1 pound mix the whole thoroughly, remove therefrom a representative sample of about 1 pound, and proceed as directed above. Powder the sample thus obtained and determine the remainder of the volatile matter as follows:

(*b*) MOISTURE.

Dry 2 grams of the powdered sample (prepared as above if not already dry enough to powder) in an air oven at 105° to 110° C. to constant weight. Calculate the total volatile matter from this loss and the loss obtained in the preliminary drying. Subtract from this total volatile matter any free acetic acid or free ammonia that may be present in the sample and report the remainder as moisture.

(*c*) FREE ACETIC ACID.

Weigh out from 2 to 10 grams of the original sample, transfer to a flask with from 20 to 40 cc of water, connect with a condenser, and heat to boiling. Pass steam through the solution, regulating the flame under the flask so that the volume will remain nearly constant, and collect about 200 cc of distillate. Titrate the distillate with tenth-normal sodium hydroxid, using phenolphthalein as indicator, and calculate as acetic acid.

(*d*) FREE AMMONIA.

Wash from 2 to 10 grams of the original sample into a distillation flask and dilute to about 150 cc. Boil down to about 25 cc and collect the distillate in standard acid. Titrate with standard alkali, using cochineal as indicator, and calculate the ammonia from the acid equivalent.

(8) That the provisional cyanid method for formaldehyde be changed to read as follows: Under 2, line 8, page 33, Bulletin 107, Revised, strike out "dilute formaldehyde solution" and insert the words "formaldehyde solution containing not over 2.5 grams of a 1 per cent solution or the equivalent;" and that the method as changed be adopted as official.

This recommendation was made in 1909 and came up for final action. The committee recommended that the referee on insecticides so change the method as to provide for neutralizing the acidity of the peroxid before using it as a reagent and that the method, with this change incorporated, be adopted as official.

Adopted.

(In accordance with the action of the committee the referee submits the following statement to replace the data under "(1) Solutions required," p. 33, Bul. 107, Rev.:

(*a*) *Sulphuric acid*, a normal solution.

(*b*) *Sodium hydroxid*, a normal solution.

(*c*) *Hydrogen dioxid*, an approximately 3 per cent solution. (In case the hydrogen dioxid solution is acid it should be neutralized with normal sodium hydroxid, using litmus solution as indicator.)

(*d*) *Indicator*, a solution of purified litmus.

WATERS.

It is recommended—

(1) That the methods for the analysis of waters submitted in 1909, and printed in Circular 52, page 4, be again tested by the association, paying special attention to following the details of the methods as outlined.

Adopted.

COMMITTEE B.—F. W. WOLL, CHAIRMAN.[1]

(Dairy products, foods and feeding stuffs, sugar, tannin, and medicinal plants and drugs.)

FOODS AND FEEDING STUFFS.

It is recommended—

(1) That the following method for the determination of acidity in feeds be further studied:

Weigh 10 grams of the sample into a shaking bottle, add 200 cc of distilled water, and shake for 15 minutes. Filter the extract through a folded filter and use an aliquot of 20 cc (equal to 1 gram of the sample) for the titration. Dilute with 50 cc of distilled water and titrate with standard decinormal sodium hydroxid solution, using phenolphthalein as indicator.

This recommendation was adopted as presented by the committee (the referee having recommended the adoption of the method as provisional), together with the following, also offered by the committee on recommendations:

(2) That the subject of acidity in commercial feeds be further studied with special reference to eliminating the error due to proteids or deciding whether the acidity due to proteids should be included in the determination.

Recommendations 1 and 2 were adopted.

(3) That the referee make a study of the literature on the amount of protein in the various vegetable products used for feed and report to the association at the 1911 meeting on the advisability of adopting more accurate factors for converting nitrogen into protein than the present factor of 6.25.

Adopted.

(4) That the referee study the method of extracting fat with petroleum ether boiling below 65° C., and other solvents, as applied to cottonseed products.

Adopted.

(5) That the proposed modification of the official method for the determination of crude fiber in foods and feeding stuffs be further studied.

Carried.

The modified method as submitted by Mr. Sweeney, of the Geneva station, reads as follows:

Place 2 grams of the sample in a wide-mouth Erlenmeyer flask of liter size, inserting a small air condenser in the mouth of the flask to prevent concentration due to loss of steam. To the sample add 200 cc of a 1.25 per cent solution of boiling sulphuric acid, as in the official method. Heat to boiling and after boiling for 30 minutes treat as follows: Neutralize with a 10 per cent solution of sodium hydroxid, using a few drops of phenolphthalein as indicator. Approximately 25 cc of sodium hydroxid is required. Add at once 200 cc of a 2.656 per cent solution of boiling sodium hydroxid and continue the digestion at the boiling point for 30 minutes longer in the same manner as in the treatment with acid. Then filter the alkaline solution containing the fiber residue through a linen cloth rapidly and wash repeatedly with boiling water. Transfer the fiber residue to a tared platinum Gooch crucible and wash with alcohol and ether. Dry at 100° C. and weigh. Ignite the dried residue and again weigh, the loss in weight giving the weight of fiber.

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[1] In the absence of the chairman this report was submitted by F. P. Veitch.

DAIRY PRODUCTS.

It is recommended—

(1) That the Roese-Gottlieb method be adopted as provisional for the determination of fat in milk, and condensed milk, both sweetened and unsweetened.

Carried. (Recommended to the committee by G. E. Patrick as official.)

(2) That the Roese-Gottlieb method be further studied for the analysis of ice cream, milk powders, malted milks, and milk chocolates.

Adopted.

(3) That the referee on dairy products study the determination of the modified Schmidt-Bondzynski method as presented by G. E. Patrick, for the determination of fat in cheese.

Adopted.

These methods read as follows:

THE ROESE-GOTTLIEB METHOD FOR THE DETERMINATION OF FAT IN CONDENSED AND EVAPORATED MILK.

Weigh from 4 to 5 grams of the homogeneous sample of condensed or evaporated milk into a Röhrig tube [1] or some similar apparatus and dilute with water in the tube to about 10.5 cc (or, if preferred, weigh into the tube from 10 to 11 grams of a 40 per cent solution of the substance). Add 1.25 cc of concentrated ammonium hydroxid (2 cc if the sample is sour) and mix thoroughly with the milk. Add 10 cc of 95 per cent alcohol and mix well. Then add 25 cc of washed ethyl ether and shake vigorously for half a minute, then 25 cc of petroleum ether (redistilled slowly at a temperature below 60° C. preferably), and shake again for half a minute. Let stand 20 minutes, or until the upper liquid is practically clear and its lower level constant. Draw off as much as possible of the ether fat solution (usually 0.5 to 0.8 cc will be left) into a weighed flask through a diminutive, quick-acting filter of selected paper. The flask should always be weighed with a similar one as a counterpoise.

Reextract the liquid remaining in the tube, this time with only 15 cc of each ether, shaking vigorously half a minute with each, and allow to settle. Draw off the clear solution through the small filter into the same flask as before and wash the tip of spigot, the funnel, and the filter with a few cubic centimeters of a mixture of the two ethers in equal parts (previously mixed and free from deposited water). For absolutely exact results the reextraction must be repeated. This third extraction yields usually not more than about a milligram of fat if the previous ether-fat solutions have been drawn off closely, an amount averaging about 0.02 per cent on a 4-gram charge. Evaporate the ether slowly on the steam bath, then dry the fat in a boiling water oven until loss of weight ceases.

Prove the purity of the fat by dissolving in a little petroleum ether. Should a residue remain, wash the fat out completely with petroleum ether, dry the residue, weigh, and deduct the weight. (This should not often be necessary.) Finally deduct the weight obtained by blank determination on the chemicals used.

ROESE-GOTTLIEB METHOD FOR THE DETERMINATION OF FAT IN ICE CREAM.

Weigh from 3 to 5 grams of the homogeneous sample into a Röhrig tube or similar apparatus, dilute with water to about 10.5 cc, and proceed as in the determination of fat in condensed milk.

ROESE-GOTTLIEB METHOD FOR THE DETERMINATION OF FAT IN MILK POWDER.

Weigh 1 gram of the powder in a 30 cc lipped beaker. Rub up with 9 cc of water and 2 cc of concentrated ammonium hydroxid, digest on steam bath until the casein is well softened and the whole resembles milk. Cool, transfer to a Röhrig tube or similar apparatus, using 10 cc of 95 per cent alcohol for rinsing, followed (after shaking contents of tube) by 25 cc of washed ethyl ether. Shake vigorously for one-half minute, and proceed as in the determination of fat in condensed milk.

SCHMIDT-BONDZYNSKI METHOD, MODIFIED, FOR THE DETERMINATION OF FAT IN CHEESE.

Rub up 1 gram of the homogeneous sample with 9 cc of water and 1 cc of concentrated ammonium hydroxid in a narrow beaker of from 100 to 125 cc capacity, using a glass rod; digest at a gentle heat until the casein is well softened; neutralize[1] with concentrated hydrochloric acid (using litmus paper as an indicator); add 10 cc of concentrated hydrochloric acid and boil gently for five minutes, keeping the beaker covered with a watch glass and adding a pinch of sand to prevent bumping. Cool somewhat, transfer to a Röhrig tube or some similar apparatus, rinsing the beaker with 25 cc of washed ethyl ether; shake well, add 25 cc of petroleum ether of the quality used in the Roese-Gottlieb method for fat in other milk products, and proceed as in that method.

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[1] Zts. Nahr. Genussm. 1905, 9: 531.

TANNIN.

It is recommended—

(1) That the work be continued, paying special attention to the extraction of water solubles, determination of fats, comparison of the determination of nitrogen on the original and the fat-free sample, and the development of tests indicative of the wearing qualities of leather.

Carried.

MEDICINAL PLANTS AND DRUGS.

It is recommended—

(1) That the provisional methods for the determination of alkaloids designated as "(*a*) Total extraction method," and "(*b*) Aliquot method" (see Bureau of Chemistry Bul. 107, Rev., p. 258), with the modifications introduced in 1908 (see Bul. 122, p. 130), be replaced by the modified method suggested by the referee. (See Bul. 132, p. 192, for modifications, and Cir. 52, p. 14, for full statement of the method.)

This recommendation was referred to the association from the previous year for action in 1910, but it was recommended that action be again deferred until 1911, in order to afford an opportunity for conference with the committee on revision of the Pharmacopœia.

(2) That the method for the separation of acetanilid, caffein, sodium bicarbonate, and sugar be made *provisional.* (N. B.—Read *official* at the meeting by error.)

This recommendation was referred to the association from the previous year for action in 1910, and was carried. (See Bul. 132, p. 197, for method.)

(3) That the method for the estimation of acetphenetidin in the presence of caffein and other agents be made the subject of further investigation (see Bul. 132, p. 198), and in addition that the method for estimating salicylic acid in the presence of boric, benzoic, cinnamic, and other acids be tested in connection with the cooperative work contemplated for the coming year.

Carried.

An abstract of this method follows:

METHOD FOR THE DETERMINATION OF SALICYLIC ACID IN THE PRESENCE OF BORACIC BENZOIC, AND CINNAMIC ACIDS.

(Modified Bougault method.)

The sample for analysis should contain about 0.1 to 0.2 gram of salicylic acid. Dissolve this sample in 100 cc of water to which has been added from 1 to 2 grams of anhydrous sodium carbonate (the amount of carbonate used being ten times that of the salicylic acid). Heat solution nearly to boiling, then add from 35 to 40 cc of fifth-normal iodin in potassium iodid (or double this amount of tenth-normal iodin solution), enough to insure an excess of iodin. Heat one hour on steam bath to near the boiling temperature, during the course of which a violet red precipitate of tetraiododiphenylenquinon will appear. After removing the excess of iodin by the addition of a few drops of hypo, the liquid is poured off through a tared gooch crucible, care being taken that most of the precipitate remains in the flask. Add 50 cc of boiling water to the precipitate in the flask, allow to digest for 10 minutes on a steam bath, then pour into a gooch, into which the precipitate is gradually washed, using for this purpose and subsequent washing about 200 cc of hot water. Dry to constant weight in an air bath at 100° C. Multiply the weight of precipitate obtained by 0.4012 and the product will be the weight of the salicylic acid present. The other acids present in the original mixture will be found in the filtrate from the precipitate just weighed and may be estimated according to several known methods.

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[1] In practice, this neutralizing has often been omitted without apparently affecting results.

(4) That the methods for the analysis of medicated soft drinks be studied and criticized by the association.

Carried.

These methods read as follows:

METHODS FOR THE ANALYSIS OF MEDICATED SOFT DRINKS.

Specific gravity.

Determine the specific gravity at 20° C. by means of an accurate pyknometer. The figure obtained may be used in subsequent work for calculating the weight of the sample when it is measured out with a standard pipette or flask graduated at 20° C.

Total solids, volatile constituents, and ash.

Introduce 25 cc of the sample by means of a pipette or flask graduated at 20° C., or weigh an amount equal to that volume into a 9 cm porcelain (not platinum) evaporating dish, previously tared; dry in a vacuum oven heated at 70° C. for five hours, or evaporate on a steam bath until there is apparently no further loss, then heat for five hours in an oven at 100° to 105°; cool in a desiccator and weigh rapidly. This weight represents the total solids, and the difference between this figure and the weight of the sample is the volatile matter.

To determine the ash, place the porcelain dish on a triangle, apply a strong flame of a Bunsen burner to the surface of the thick mass. The contents of the disk will gradually intumesce but will not froth over if the flame is not removed or heat applied to the bottom of the dish. When ebullition ceases, cautiously heat the sides of the dish, and if no liquid mass exudes through the cracks of the carbonaceous material, gradually bring the flame to the bottom of the dish and heat until the mass is thoroughly charred; cool, thoroughly moisten the char with dilute acetic acid, and place in an oven to dry. When thoroughly dried, heat gradually with a Bunsen flame and finally ignite with a blast flame or in a muffled oven; weigh residue as ash. The operator when igniting the saccharine residue may at first experience some trouble, but with a little care no difficulty should be encountered in carbonizing the entire contents without loss.

Alcohol.

The amount of this ingredient is usually small, and for this reason samples of from 50 to 100 cc are required to make a determination. Measure this quantity into the distilling apparatus and rinse the measuring flask with water, using an amount equal to the original volume used. Distil into the flask for measuring until it is about two-thirds full and fill up to the mark with distilled water. If the liquid is clear and the odor of volatile oils is faint the specific gravity may be determined at once at either 15.6° or 25° and the percentage of alcohol by volume obtained from the tables in the Pharmacopœia or in Bulletin 107, Revised, page 203. Should there be a turbidity or a strong odor of essential oils, the distillate must be further treated according to the following method of Thorpe and Holmes.[1] Transfer to a separator, rinse the flask with a little water, saturate the solution with sodium chlorid, and add 25 cc of petroleum ether, boiling between 40° and 60° C. Shake for five minutes, let stand one-half hour, draw off the lower layer into another separator, and shake it out with another portion of petroleum ether. Combine the ethereal extractions, wash them with 25 cc of an aqueous solution saturated with sodium chlorid, draw off the latter, add it to the distillate, and return the resulting mixture to the distillation flask. Distil this mixture to the same volume as was originally employed, determine the specific gravity of the distillate, and calculate the per cent of alcohol as usual.

Caffein.[2]

Measure 50 cc of the substance at 20° C., or weigh about this volume into a small beaker, add 5 cc of stronger ammonium hydroxid (28 per cent), allow to digest twelve hours, or overnight; then add 2 cc more of stronger ammonium hydroxid, and heat for two hours; transfer to a large separator, rinsing beaker with water; dilute with about three volumes of water, add 5 cc of stronger ammonium hydroxid, and shake out with four successive portions of chloroform, using 50 cc at a time. In case any dyestuff is removed by the chloroform, the combined solutions should be shaken out with a saturated solution of sodium bisulphite, which will remove some of the coloring material.

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[1] J. Chem. Soc., 1903, 83:313.

[2] When it is desired to determine the caffein in an "extract" or "flavor" proceed according to the method described under "Caffein, cocain, and glycerin in one sample," page 9.

Collect the chloroform extracts in a flask, recover the bulk of solvent by distillation, then pour the remainder, with rinsings, into an evaporating dish and evaporate. Dissolve the residue in 25 cc of about 2 per cent sulphuric acid, shake out the acid solution five times with 15 cc portions of chloroform, filter the chloroform solutions into a flask, recover bulk of chloroform, and pour remainder of solution with rinsings into a tared dish; evaporate at 100° C., cool, and weigh. If the caffein is not pure, dissolve the residue in 15 cc dilute (10 per cent) hydrochloric acid, add iodin solution (iodin, 10 grams, and potassium iodid 20 grams dissolved in 100 cc water) in excess, allow the mixture to stand overnight, filter, and wash the precipitate twice with 10 cc of the prescribed iodin solution. Transfer filter paper with precipitate to the original precipitation flask, add sufficient sulphurous acid to dissolve the precipitate with the aid of gentle heat, filter into a separator, wash three times with distilled water, add ammonium hydroxid in excess, shake out four times with 15 cc portions of chloroform, filter the chloroform extracts into a flask, using a small funnel and a 7 cm filter paper and covering with a small watch glass, wash the filter with five portions of 5 cc each of chloroform to remove the last portions of caffein; or, better, run through absorbent cotton plugged in the stem of the separator. If final chloroform is colored, concentrate, add small amount of animal charcoal, rotate several times, and filter. Recover part of the solvent, pour balance into tared dish, evaporate, dry at 100° C., and weigh.

Cocain; detection and determination.

Pour 200 cc of the product into a large separator, add stronger ammonium hydroxid (28 per cent) until alkaline, and shake out with three successive portions of 50 cc each of Prolius mixture (ether 4 parts, chloroform 1 part, alcohol 1 part), collecting the solvent in another separator. If desired the aqueous solution may be reserved for the detection of salicylic and benzoic acids and saccharin. Filter the combined Prolius extracts into an evaporating dish or beaker and evaporate over the steam bath, removing the dish as the last traces of the solvent disappear; dissolve the residue in normal sulphuric acid, transfer to a separator, and shake out four times with 15 cc portions of chloroform, collecting the chloroform solutions in another separator. Wash the combined chloroform solutions once with distilled water, discard the chloroform, and add the water to the original acid solution; add 10 cc of petroleum ether boiling at 40° to 50° C., and shake; draw off the acid layer and discard the petroleum ether; add stronger ammonium hydroxid in excess, and shake out three times with 15 cc portions of petroleum ether, collecting the ethereal solutions in another separator. To the latter add 10 cc distilled water and shake thoroughly; discard the water, and filter the petroleum ether into a beaker; wash filter twice with 10 cc portions of petroleum ether and then evaporate over a steam bath, using a fan. By the above method if coca alkaloids are present a nearly colorless residue will be obtained, which will finally crystallize on standing.

The cocain may now be detected by the following reactions: Dissolve the residue in petroleum ether and divide into four portions, one of which may be quite small. Evaporate the solvent and to the small portion add a few drops of normal sulphuric acid; warm gently and filter into a test tube; add a drop of potassium mercuric iodid test solution (Mayer's reagent), and note whether a precipitate is formed. A precipitate would indicate an alkaloid but would not distinguish cocain; if no precipitate occurs, it would indicate that no cocain was present and no further tests are necessary.

To another portion add a few drops of concentrated nitric acid and evaporate over the steam bath until the acid is all driven off, then add a few drops of half normal alcoholic potash and note the first odor which comes off. In the presence of cocain a distinct odor of ethyl benzoate will be obtained, but unless one is familiar with the odor a control test should be made.

The residue in the third portion should be applied to the end of the tongue by rubbing with the finger. Cocain will cause a numbness which is not apparent immediately, but develops gradually, and persists for a longer or shorter period, depending on the quantity present. It is advisable to run a parallel experiment with pure cocain in order to become familiar with the physiological effects of this alkaloid.

Remove a portion of the fourth residue and place on a microscopic slide; add a drop or two of a gold chlorid test solution and stir vigorously with a glass rod, noting the character of the crystals under the microscope. The crystals formed with gold chlorid and cocain are characteristic and should be compared with those obtained with a solution of pure cocain.

The procedure given here for separating the coca alkaloids may be employed if a quantitative estimation is desired. The residue obtained on evaporating the petroleum ether should be weighed and then a titration made as a check on the gravimetric determination. Run in 50 cc fiftieth-normal sulphuric acid and warm until residue is completely dissolved, then cool and titrate with fiftieth-normal potassium hydroxid or sodium hydroxid, using cochineal as an indicator. The factor for cocain is 0.006018.

Caffein, cocain, and glycerin in one sample.

Caffein may be determined quantitatively, and cocain and glycerin detected by the following method, though the failure to detect cocain should not prevent one from examining further for it, as the alkaloid is liable to be destroyed during the manipulation of the caffein. This method is of no value for the determination of glycerin, but will prove reliable if it is desired to simply detect this ingredient.

Measure accurately at 20° C., with a graduated flask or pipette, 50 cc of the sample, or weigh about this volume into an evaporating dish; add 5 cc of stronger ammonium hydroxid (28 per cent), cover dish with watch glass, and allow it to stand 12 hours; add 2 cc more of stronger ammonium hydroxid and evaporate over steam bath until there is no further diminution in volume. Treat the residue with 25 cc portions of 95 per cent alcohol; warm over steam bath; cool, and pour off alcohol into another evaporating dish; repeat this procedure four times and then evaporate the alcoholic extract. Dissolve the residue in 25 cc of approximately 2 per cent suphuric acid, transfer to separator, shake out five times with 15 cc portions of chloroform, running the chloroform extracts into a 250 cc Erlenmeyer flask, and reserve the solution in separator for subsequent testing for cocain and glycerin. Recover part of chloroform, pour rest of solution into an evaporating dish, and evaporate over steam; dissolve the residue in dilute (10 per cent), hydrochloric acid, transfer to a small flask, add an excess of iodin solution (iodin 10 grams, potassium iodid 20 grams, dissolved in 100 cc water), rotate the flask; allow precipitate to settle and let stand over night; filter and wash the flask and precipitate twice with the above iodin solution and then transfer the filter and precipitate to the original precipitation flask; treat with sufficient sulphurous acid to dissolve the precipitate with the aid of gentle heat; filter into a separator, cool, add excess of stronger ammonium hydroxid, shake out four times with 15 cc portions of chloroform; filter extracts into a flask, using a small funnel and a 7 cm filter paper, covered with a watch glass, washing the filter with five portions 5 cc each of chloroform; or filter through cotton plugged in the stem of the separator. If chloroform is still colored decolorize with animal charcoal. Recover part of chloroform and pour the residual solution in the flask into a tared dish; evaporate over steam, dry at not over 100° C., and weigh.

Add excess of stronger ammonium hydroxid to the original solution from which the caffein was removed; shake out three times with petroleum ether (boiling at 40° to 60° C.), filter the ether extractions into four small beakers; evaporate the solvent, and examine residues for cocain as described in the preceding method.

Evaporate the solution remaining in the separator after shaking out the caffein and cocain with milk of lime. Continue as directed in Bulletin 107, Revised, page 83, under "Glycerol in wines." This method can be depended upon for approximate results.

Sugar determinations.

Use the Munson-Walker methods described in Bulletin 107, Revised, pages 40 and 42.

Phosphoric acid.

Measure 25 cc of the sample with a flask or pipette graduated at 20° C. or weigh an amount equal to this volume into a 250 cc beaker, heat until alcohol is all driven off; dilute with water to about 100 cc and add 30 cc stronger ammonium hydroxid. Run in slowly from a burette 50 cc of magnesia mixture, U. S. P test solution, stirring vigorously; allow precipitate to settle; run in 1 or 2 cc more of magnesia mixture, to see whether precipitation is complete; add 25 cc of stronger ammonium hydroxid (28 per cent), and let stand overnight.

Filter and wash precipitate three times with 2 per cent ammonium hydroxid; dissolve in 15 cc of 10 per cent nitric acid, washing filter three times with distilled water; add excess of ammonium molybdate, U. S. P. test solution and heat to 50° C.; filter and wash precipitate with distilled water until free of acid. The precipitate may be treated in either of two ways; it may be transferred to a beaker with distilled water, dissolved in excess of standard potassium hydroxid solution 1 cc of which equals 0.0010 gram of phosphoric acid (P_2O_5) and the excess titrated with standard hydrochloric acid of the same strength (see Bul. 107, Rev., p. 4), or the precipitate may be dissolved in 10 to 20 cc of stronger ammonium hydroxid and the filter washed three times with boiling water, the mixture cooled and magnesia mixture added drop by drop with vigorous stirring, 25 cc stronger ammonium hydroxid added, and the mixture allowed to stand overnight. Filter onto an ashless filter paper, wash three times with 1 per cent ammonium hydroxid, dry, ignite, and weigh as magnesium pyrophosphate ($Mg_2P_2O_7$); if the precipitate does not burn white, cool, add a few drops concentrated nitric acid, evaporate dry and again ignite. Calculate the phosphoric acid (P_2O_5) from the weight of magnesium pyrophosphate ($Mg_2P_2O_7$).

Salicylic and benzoic acids and saccharin.

To detect the presence of these ingredients the ammoniacal solution from which the cocain was extracted may be employed, or if desired a fresh sample may be used. Add an excess of dilute 10 per cent sulphuric acid, shake out three times with 50 cc portions of Prolius's mixture; combine the extracts, filter into a beaker, and evaporate over a steam bath, using fan.

The presence of appreciable quantities of saccharin in the residue is readily detected by the sweet taste. This may be confirmed by heating with sodium hydroxid in a test tube to 215° C. in an oil bath and finally detecting the salicylic acid formed. (See Bul. 107, Rev., p. 182.)

If salicylic acid is present in the residue a small portion on warming with water and subsequent cooling will give the characteristic purple color with solution of ferric chlorid. If both salicylic acid and saccharin are present the former must be removed before fusing the saccharin with sodium hydroxid. Dissolve the residue in dilute hydrochloric acid, add bromin water in excess, shake well and filter; salicylic acid is completely removed as the bromin derivative; make the filtrate strongly alkaline with sodium hydroxid test solution, evaporate, heat to 215° C., and finally extract the salicylic acid formed.

Benzoic acid in the residue may be detected by placing the beaker covered with a watch glass on the top of a steam or water bath, but not exposed to the steam; the acid will soon form a sublimate on the watch glass and the cool portion of the beaker, and may be confirmed by its melting point. If salicylic acid occurs with benzoic it may be removed by bromin water as described above. The solution after filtering should be rendered alkaline and then slightly acidified and the benzoic acid shaken out with ether.

Dyestuffs.

For the detection and determination of added coloring matters use the methods described in Bulletin 107, Revised, page 190.

(5) That the method for the determination of morphin in opium and opium preparations be studied and criticized by the association.

Carried.

These methods read as follows:

METHODS FOR THE DETERMINATION OF OPIUM AND OPIUM PREPARATIONS.

Opium.

Dry and powder sample, place 1 gram in a 100 cc Erlenmeyer flask, add 100 cc of lime water (U. S. P.), and shake thoroughly every ten minutes for two hours. Let settle, decant through a tuft of cotton, and collect 50 cc, introduce into a separatory funnel, shake out three times with chloroform, using 15 cc each time, and then with 15 cc of washed ether. Collect ether-chloroform in another separatory funnel and wash with 10 cc of lime water; return lime water to original solution and reject the immiscible solvent. To the solution now add 20 cc of alcohol, then enough of a 1 per cent ammonium chlorid solution to free the morphin, testing with wet litmus paper held in the neck of the funnel. Follow with 30 cc of chloroform and shake thoroughly for several minutes. Draw off and repeat shaking, first with 10 cc of alcohol and then with 20 cc of chloroform four times. Combine the alcohol-chloroform shake-outs and wash in 10 cc of water; pass through a filter wet with chloroform into a tared beaker of 150 cc capacity; evaporate to dryness at a gentle heat, dissolve in 12 cc of fiftieth-normal sulphuric acid and titrate back with fiftieth-normal potassium hydroxid; use cochineal as an indicator and calculate to mono-hydrated morphin. Multiply the number of cubic centimeters of fiftieth-normal sulphuric acid consumed by 0.006 and then by 200 to obtain the weight of crystallized morphin in 100 grams.

Paregoric.

Evaporate 100 to 15 cc, wash into separatory funnel, shake out with two portions of washed ether, 15 cc each, and reject. Add 50 cc of lime water, agitate thoroughly, filter and proceed as under opium with the shaking-out process. Titrate the alkaloid.

Soothing sirups.

Make acid 100 cc and then make barely alkaline with ammonium hydroxid, and extract with an alcohol-chloroform mixture to total exhaustion; evaporate with a blast on a water bath, take up in 50 cc of lime water, and proceed as under opium.

(6) That the work on microscopical and macroscopical methods and on the microchemical study of drugs be continued along the present lines.

Carried.

(7) That two additional associate referees be appointed, as follows: One on synthetic drug products, and another on methods for the determination of the essential ingredients in medicated soft drinks containing alkaloids, digestive ferments, and drug principles, exclusive of mineral waters and simple soda-fountain beverages.

Carried.

SUGAR.

It is recommended—

(1) That further work be done on the Horne dry lead clarification, with the view to ascertaining whether it is advisable to adopt it as the sole official method.

(2) That a study be made of the effect of variation in polarizations due to the composition of the basic lead acetate. (See Browne, Bul. 122, p. 223.)

(3) That the moisture determination by refractometer be further studied, with special reference to the use of a sugar solution instead of water as a diluent in dark-colored products.

(4) That factors be determined for the formula used in calculating commercial glucose to replace the factors 175 and 163 now used.

(5) That Herles solution and neutral lead acetate be adopted provisionally as clarifying agents in polarizing cane products.

As this report was received too late to be considered by Committee B, the association acted only on the first four recommendations relating to future work. These were adopted, but no action was taken on recommendation 5.

COMMITTEE C.—A. L. WINTON, CHAIRMAN.

(Food adulteration.)

SPICES.

It is recommended—

(1) That on page 168 of Bulletin 107, Revised, under "9. Crude fiber," the following words be inserted at the end of the paragraph: "; the fiber, however, should finally be washed successively with alcohol and ether until all fat is removed."

Carried.

(2) That a comparative study be made of the determination of fiber with and without preliminary drying and extraction of fat.

Carried.

(3) That the method for the detection of olive oil in paprika, submitted by the referee, be made provisional.

Carried.

(4) That a further study be made of the chemical characteristics of paprika extract, with a view to detecting added foreign oils other than olive oils and of drying the ether extract in vacuo and in hydrogen.

Carried.

The method reads as follows:

METHOD FOR THE DETECTION OF OLIVE OIL IN PAPRIKA.

Spread 5 grams of paprika on a watch crystal and dry over sulphuric acid for at least 12 hours. Measure 250 cc of anhydrous alcohol-free ether, prepared as directed on page 39 of Bulletin 107, Revised, into a graduated flask on which the mark is situated near the lower end of the neck, and brush the paprika into it. Place a mark on the neck of the flask at the point where the meniscus is, and allow to stand for one hour, shaking at 20-minute intervals during that time. Bring the meniscus back to the mark placed upon the neck, either by cooling the flask and contents if the level has risen, or by adding absolute ether if it has fallen; let the solid particles settle and pipette off 100 cc of the supernatant liquid, filter through an 11 cm closely woven paper into a tared, air-dry, 250 cc Erlenmeyer flask (glass stoppered) that has been counterpoised against a similar flask, wash the paper with a little absolute ether, and then distil off the solvent, removing the flask from the bath as soon as the ether ceases to come over. Lay the flask on its side in a water oven and heat for 30 minutes; cool the open flask for at least 30 minutes in the air, and weigh. Repeat this heating and weigh until the weight is constant to within 1 mg, two heatings usually being sufficient. Note the per cent of ether extract obtained. In case more than one and one-half hours of heating is required to obtain constant weight, or if the ether extract becomes colorless, it should be rejected and a new determination started with freshly purified ether.

Dissolve the ether extract in the flask with 10 cc of chloroform, and when solution is complete add 30 cc of Hanus solution, following the method on page 137, Bulletin 107, Revised, and allowing 30 minutes for the halogen absorption. Note the iodin number of the ether extract. A second aliquot of 100 cc, measured out immediately after the first, may be taken from the ether extract in the graduated flask in order to run a duplicate determination of the iodin number. The iodin number thus obtained should not be less than 125.

SEPARATION OF VEGETABLE PROTEIDS.

It is recommended—

(1) That in the method for the determination of salt-soluble nitrogen all words from "Place filtrate in Kjeldahl digestion flask" to end of paragraph be omitted and replaced by "and determine nitrogen by the Kjeldahl or Gunning method."

This recommendation, which refers to the method submitted by the referee for study, was carried. The method reads as follows:

Salt-soluble nitrogen.—Place 15 grams of flour in a 500 cc Erlenmeyer flask. Add 33 cc of 10 per cent sodium chlorid solution. Keep at 30° C., shaking at intervals of 10 minutes for two hours. Let stand one hour. Pipette from the clear supernatant liquid two aliquots of 100 cc each into filter. Refilter if necessary until clear. Finally wash filter paper with a 10 per cent salt solution. *Place filtrate in Kjeldahl digestion flask, add 5 cc of concentrated sulphuric acid, and evaporate nearly to dryness. Add remainder of acid necessary for oxidation and determine nitrogen by the Kjeldahl method.* (For italics read "and determine nitrogen by the Kjeldahl or Gunning method.")

(2) That the influence of the strength of salt solutions upon the proportion of nitrogen dissolved be made a matter of study.

Carried.

(3) That the work of separating the various proteins in flour be carried out in conjunction with actual baking trials.

Carried.

SEPARATION OF MEAT PROTEIDS.

It is recommended—

(1) That a special study be made of the hydrolytic cleavage products of the nitrogenous bodies in beef extracts in order to determine what bodies resist the Kjeldahl digestion when a large sample of beef extract is used.

Carried.

(2) That cooperative tests with the Kjeldahl method as applied to beef extracts be made with a view to determining the best conditions for complete digestion.

Carried.

(3) That cooperative work on the separation of meat proteins in beef extracts be continued.

Carried.

FATS AND OILS.

It is recommended—

(1) That the following method for the detection of fish oil in the presence of vegetable oils be adopted as provisional:

METHOD FOR THE DETECTION OF FISH OIL IN THE PRESENCE OF VEGETABLE OILS AND IN THE ABSENCE OF METALLIC SALTS.

Dissolve in a test tube about 6 grams of the oil in 12 cc of a mixture of equal parts of chloroform and glacial acetic acid. Add bromin drop by drop until a slight excess is indicated by the color, keeping the solution at about 20° C. Allow to stand 15 minutes or more and then place the test tube in boiling water. If only vegetable oils are present the solution will become perfectly clear, while fish oils will remain cloudy or contain a precipitate due to the presence of insoluble bromids.

Carried.

ORGANIC AND INORGANIC PHOSPHORUS IN FOODS.

It is recommended—

(1) That the magnesia mixture method of Forbes,[1] the barium chlorid method of Siegfried and Singewald,[2] and the neutral ammonium molybdate method of Hart and Andrews[3] as modified by Emmett and Grindley,[4] for the separation and estimation of inorganic and organic phosphorus in foods, be further studied with a view to determining their accuracy.

Carried.

DAIRY PRODUCTS (ADULTERATION OF).

It is recommended—

(1) That the line of work recommended by the referee in 1909 be continued. (See Cir. 52, p. 18, or Bul. 132, pp. 166 and 170.)

Carried.

PRESERVATIVES.

It is recommended—

(1) That in Bulletin 107, Revised, page 181, under "2. Benzoic acid, (*a*) Qualitative determination," the first sentence be changed to read as follows: "Separate the benzoic acid as directed for salicylic acid, or by the method given under '(*b*) Qualitative estimation'."

Carried.

(2) That in Bulletin 107, page 181, for "(2) Second method (Mohler's method)," the following modification by Von der Heide and Jakob be substituted:

(2) SECOND METHOD (MODIFIED MOHLER'S METHOD).[5]

Add to the water solution prepared as described under (*a*) from 1 to 3 cc of third-normal sodium hydroxid and evaporate to dryness. To the residue, add from 5 to 10 drops of concentrated sulphuric acid and a small crystal of potassium nitrate. Heat for 10 minutes in glycerol bath at 120° to 130° C., or for 20 minutes in boiling-water bath. This causes the formation of meta-di-nitro benzoic acid. In no case must the temperature exceed 130° C. After cooling add 1 cc of water and make decidedly ammoniacal; boil the solution to break up any ammonium nitrite which may have been formed. Cool and add a drop of fresh colorless ammonium sulphid, without allowing the layers to mix. A red-brown ring indicates benzoic acid. This is due to the formation of ammonium meta-di-amido benzoic acid. On mixing, the color diffuses through the whole liquid; on heating it finally changes to greenish yellow owing to the decomposition of the amido acid. This furnishes a means of distinguishing benzoic acid from salicylic acid or cinnamic acid. The last two form amido compounds, which are not destroyed by heating. The presence of phenolphthalein interferes with this test.

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[1] Ohio Agr. Exper. Sta., 1910, Bul. 215, p. 484.

[2] Zts. Nahr. Genussm., 1905, *10*:521.

[3] Amer. Chem. J., 1903, *30*:470.

[4] J. Amer. Chem. Soc., 1906, *28*:26.

[5] Zts. Nahr. Genussm., 1910, *19*(3):137; Chem. Abst., 1910, *4*(11):1528.

(3) That the method given on page 181, Bulletin 107, Revised, under "(*b*) Quantitative estimation," be dropped and the following substituted as a provisional method:

(*b*) QUANTITATIVE ESTIMATION.

General method of preparation.

Grind the sample in a sausage machine, if solid or semisolid, and mix thoroughly. Transfer a convenient quantity, about 150 grams, to a 500 cc graduated flask, add enough pulverized sodium chlorid to saturate the water in the sample, render alkaline with sodium hydroxid or milk of lime, and dilute to the mark with a saturated salt solution. Allow to stand for at least two hours, with frequent shaking, and filter. If the sample contains large amounts of matter precipitable by salt solution, it is advisable to follow a method similar to that given under "Salt or dried fish." When alcohol is present, follow the method given under "Cider." When large amounts of fats are present, it is well to make an alkaline extraction of the filtrate before proceeding as directed under "Extraction and titration." The following paragraphs illustrate the manner of applying the method to various classes of food products:

Special methods of preparation.

Ketchup.—(See Bul. 132, p. 143, method 4.)

Jellies, jams, preserves, and marmalades.—Dissolve 150 grams of the sample in about 300 cc of saturated salt solution. Add 15 grams pulverized sodium chlorid. Render alkaline to litmus paper with milk of lime. Transfer to a 500 cc graduated flask and dilute to the mark with saturated salt solution. Allow to stand for at least two hours with frequent shaking, centrifuge if necessary, and filter through a large folded filter.

Cider and similar products containing alcohol.—Render 250 cc of the sample alkaline to litmus paper with sodium hydroxid and evaporate on the steam bath to about 100 cc. Transfer the sample to a 250 cc flask, add 30 grams of pulverized sodium chlorid and shake until dissolved. Dilute to the original volume, 250 cc, with saturated salt solution, allow to stand at least two hours with frequent shaking, and filter through a folded filter.

Salt or dried fish.—Transfer 50 grams of the ground sample to a 500 cc flask with water. Make slightly alkaline to litmus paper with strong sodium hydroxid and dilute to the mark with water. Allow to stand for at least two hours with frequent shaking and then filter through a folded filter. Pipette accurately as large a portion of the filtrate as possible (at least 300 cc) into a second 500 cc flask. Add 30 grams of the pulverized sodium chlorid for each 100 cc of solution. Shake until the salt has dissolved and dilute to the mark with saturated salt solution. Mix thoroughly and filter off the precipitated protein matter on a folded filter paper.

Extraction and titration.

Pipette a convenient portion of the filtrate (100 to 200 cc) obtained as above into a separatory funnel. Neutralize the solution to litmus paper with hydrochloric acid (1:3) and add an excess of 5 cc of the same acid. In the case of salt fish a precipitation of protein matter usually occurs on acidifying, but the precipitate does not interfere with the extraction. Extract carefully with chloroform, using successive portions of 70, 50, 40, and 30 cc. To avoid emulsion, shake each time cautiously; vigorous shaking is not necessary. The chloroform layer usually separates readily at the bottom of the funnel after standing a few minutes. If any emulsion forms, it can be broken up by stirring the chloroform layer with a glass rod. If this is unsuccessful, the emulsified portion may be drawn off into a second funnel and given one or two sharp shakes from one end of the funnel to the other. If this also fails, the emulsion should be centrifuged for a few moments. As this is a progressive extraction, great care must be taken to draw off as much of the clear chloroform solution as possible after each extraction, but under no circumstances must any of the emulsion be drawn off with the chloroform layer. If care is taken not to draw off any of this emulsion, it is unnecessary to wash the chloroform extract.

Transfer the combined chloroform extract to a porcelain evaporating dish, rinsing the container several times with a few cubic centimeters of chloroform, and evaporate to dryness at room temperature in a current of dry air. (See Note 2, Bul. 132, p. 144.) Dry the residue overnight (or until no odor of acetic acid can be detected in case the product is a ketchup) in a sulphuric-acid desiccator. Dissolve the residue of benzoic acid in neutral alcohol (30 to 50 cc), add about one-fourth this volume of water, a drop or two of phenolphthalein solution, and titrate with twentieth-normal sodium hydroxid (1 cc of twentieth-normal sodium hydroxid equals 0.0072 gram anhydrous sodium benzoate).

(4) That the Hillyer method[1] for the determination of benzoic acid as silver benzoate be tried by the association.

Carried.

(5) That further study be made of the possibility of making a direct titration of benzoic acid in the chloroform extract.[2]

Carried.

(6) That in Bulletin 107, Revised, page 187, the method given under "(*b*) Determination of total sulphurous acid, (1) First method (distillation method)," be replaced by the following:

(*b*) Determination of Sulphurous Acid.

(1) FIRST METHOD (DISTILLATION METHOD).

Distil from 20 to 100 grams of the sample (adding recently boiled water if necessary) in a current of carbon dioxid, after the addition of about 5 cc of a 20 per cent solution of glacial phosphoric acid, until 150 cc has passed over. Collect the distillate in about 100 cc of nearly saturated bromin water. Allow the end of the condenser to dip below the surface of the liquid in the receiver. The method and apparatus may be simplified without material loss in accuracy by omitting the current of carbon dioxid, adding 10 cc of phosphoric acid instead of 5 cc, and dropping into the distilling flask a piece of sodium bicarbonate weighing not more than 1 gram, immediately before attaching the condenser. The carbon dioxid liberated is not sufficient to expel the air entirely from the apparatus, but will prevent oxidation to a large extent. When the distillation is finished, boil off the excess of bromin, dilute the solution to about 250 cc, add 5 cc of hydrochloric acid (1 part of the concentrated acid to 3 of water), heat to boiling, and precipitate the sulphuric acid with a 10 per cent solution of barium chlorid. Boil for a few minutes longer, allow to stand over night in a warm place, filter on a weighed Gooch crucible, wash with hot water, ignite at a dull red heat, and weigh as barium sulphate.

Carried.

COCOA AND COCOA PRODUCTS.

It is recommended—

(1) That the method tried this year for the determination of sucrose and lactose be adopted as provisional, being substituted for the one given on page 256, Bulletin 107, Revised, and that the alternate procedure suggested for the first part of the method be further studied.

Carried. This method and the substitute section read as follows:

DETERMINATION OF SUCROSE AND LACTOSE.

Prepare the sample by chilling well and shaving it with a knife as finely as possible. Transfer 26 grams of this material to an 8-ounce nursing bottle, add thereto about 100 cc petroleum ether and shake for five minutes. Whirl the bottle in a centrifuge until the solvent is clear. Draw off the same by suction and repeat the treatment with petroleum ether. Place the bottle containing the defatted residue in a warm place until the residual traces of petroleum ether are practically expelled. Add 100 cc water and shake until all the chocolate is loosened from the sides and bottom of the bottle. and continue the shaking for three minutes longer. Add basic lead acetate solution from a burette until no more precipitation takes place, and then add sufficient water to make the total volume of liquid 110 cc. Mix thoroughly and filter through a folded filter. Make the direct polariscopic reading (*a*) in a 200 mm tube on this solution, then precipitate from the same the excess of lead by dry potassium oxalate. Invert the solution by one of the methods given on page 41, Bulletin 107, Revised. Multiply the invert reading by 2 to correct for dilution (*b*). From the figures obtained calculate the approximate percentage of sucrose (S) by the formula:

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[1] Statement of the original Hillyer method is given on page 74 of Bureau of Chemistry Bulletin 122, or J. Ind. Eng. Chem., 1909, *1:* 538. The method as originally published has been somewhat modified. The use of aldehyde-free alcohol may be dispensed with throughout, and it is unnecessary to saturate the alcohol used for washing with silver benzoate in any part of the process. The benzoic acid residue must be exactly neutralized before precipitation, and the use of an alcoholic solution of alkali is not necessary.

[2] U. S. Dept. Agr., Bureau of Chemistry, Bul. 132, p. 147.

$$S=\frac{(a-b)\times 110}{142.66-\frac{T}{2}}$$

and the approximate percentage of lactose by the formula:

$$L=\frac{(a\times 1.10)-S}{0.79}$$

From the combined approximate percentages of sucrose and lactose found above calculate the approximate number of grams of sugar present in the 26 grams of sample taken. Determine the factor "X" thus:

$$X=110+(G\times 0.62)$$

in which "G"= the approximate amount of sugar present, found as above, and 0.62 the volume in cubic centimeters displaced by 1 gram of sugar in water solution. Applying this correction:

$$\text{True per cent of sucrose}=\frac{SX}{110}$$

$$\text{True per cent of lactose}=\frac{LX}{110}$$

The following may be substituted for the method to the point at which the direct polariscopic reading is made:

Transfer 26 grams to a bottle or flask of suitable size, add 100 cc water, cork the bottle and place in steam bath for twenty minutes, releasing the pressure occasionally during the first five minutes of heating. Twice during the twenty minutes shake the container thoroughly so as to completely emulsify the chocolate solution. Remove from steam bath, cool to room temperature, add 10 cc basic lead acetate solution, mix and filter.

(2) That the method tried this year for the determination of fat be further tested to determine whether serious loss of ether takes place in a warm atmosphere, and if so to devise a method of overcoming the difficulty.

Carried.

The method reads as follows:

DETERMINATION OF FAT IN COCOA PRODUCTS.

Transfer 2 grams of finely divided material to a narrow mouth, 4-ounce bottle, add 50 cc anhydrous ether from a burette or pipette and stopper the bottle immediately with a sound cork. Shake about 10 minutes and whirl in a centrifuge until the cocoa material is firmly packed in the bottom. Fill a burette to the lower mark (50 cc mark) with ordinary ether, place a small funnel and filter paper in the top and pour the supernatant solution from the bottle through the filter into the burette, care being taken to pour the solution in such a way as to disturb the solid material as little as possible. Read off the amount of fat solution recovered from the bottle, which will vary from 45 to 48 cc in most cases. Run the ether from the burette into a tared flask or dish, washing the burette several times with ether and adding the washings to the main solution. Evaporate the ether and weigh as usual in fat determinations. The fat is calculated as follows:

$$\text{Per cent of fat}=\frac{25\ X}{Y}\times 100$$

in which "X"= weight of fat obtained after evaporation of the ether and "Y" the number of cubic centimeters of ether recovered.

(3) That the referee investigate methods for determining the amount and character of the milk solids in milk cocoas and chocolates.

Carried. (This recommendation was referred to the committee, having been introduced by Mr. Brinton as of special practical interest to food chemists.)

TEA AND COFFEE.

It is recommended—

(1) That the Gorter method for the determination of caffein in coffee be adopted as provisional in the place of the Hilger and Fricke method. (Bul. 107, Revised, p. 153.)

Carried. (The association first recommended further study of this method, but upon a supplementary report by Committee C it was made provisional. See Chemistry Bulletin 132, page 135, for statement of method, except that it was found necessary to pass the solution through a moistened filter paper in addition to the cotton plug in order to obtain a perfectly clean filtrate.)

(2) That the method of Lendrich and Nottbohm for the determination of caffein in coffee be further studied.

Carried. (See the Analyst, 1909, *34:* 214; Zts. Nahr. Genussm., 1909, *17:* 241.)

(3) That the subject of tea be studied during the coming year.

Carried.

CEREAL PRODUCTS.

It is recommended—

(1) That the associate referee on cereal products be instructed to devote special attention to methods for analyzing and testing wheat and flour.

Carried. (Included in supplementary report of Committee C. Attention was called to the fact that no methods for cereal products are given in Bulletin 107, Revised, and that milling and baking tests were also needed.)

WATER IN FOODS.

It is recommended—

(1) That the vacuum method for the determination of moisture in foods be further studied as to its special applicability to other food products, especially those containing volatile oils, and also to determine the influence of the method of moisture determination upon the subsequent determination of the ether-soluble substance (fat).

Carried. (See Bul. 122, p. 219, and Bul. 130, p. 150.)

REFERENCE TABLES.

The following recommendation was introduced by P. H. Walker and referred to Committee C:

That the tables on pages 66 (Comparison of specific gravities, degrees Brix and degrees Baumé), 67 (Correction for the readings of the Brix spindle when the reading is made at other than the standard temperature 17.5° C.), and 221 to 224, inclusive (Relation of Brix, specific gravity, and Baumé, and Correction for the readings of Balling's saccharometer, on account of temperature), be omitted from Bulletin 107, Revised, and that Table No. 7 (Temperature corrections to saccharometer readings, standard at 20° C.), No. 8 (Density of solutions of cane sugar at 20° C.), No. 11 (Degrees Baumé corresponding to specific gravities at 60° F. (15.56° C.) greater than 1), No. 12 (Degrees Baumé corresponding to specific gravities at 60° F. (15.56° C.) less than 1), and No. 13 (Conversion of density basis), from Circular 19 of the Bureau of Standards, be inserted.

The committee recommended that the tables specified be presented to the association for the consideration of the members, with a view to taking final action on the suggested substitution in 1911, which recommendation was adopted. Inasmuch as the tables may be obtained by any member of the association by applying to the Bureau of Standards for Circular 19, they will not be reprinted. The following reasons for making the substitution, as presented by Mr. Walker, are given for the information of the association:

Formerly the Brix spindle was made to read at 17°.5 C., and the tables given in Bulletin 107, Revised, are based on this standard, the corresponding specific gravity of a sugar solution being at $\frac{17^\circ.5\text{ C.}}{17^\circ.5\text{ C.}}$. The degrees Baumé given in the tables of Bulletin 107, Revised, do not refer to the American standard and can not be relied upon as being accurate with Baumé hydrometers used in this country. The standard Baumé spindles are intended to be used at 60° F. The present standard temperature for calibrating Brix spindles is $\frac{20^\circ\text{ C.}}{4^\circ\text{ C.}}$. This is the standard in this country and is also the standard which has been recommended by the International Congress of Applied Chemistry. Any Brix spindles which are sent to the Bureau of Standards for testing will be tested according to Table No. 8 of Bureau of Standards Circular 19. Because of the different temperatures at which the spindles are calibrated, it is not feasible to convert degrees Brix into degrees Baumé, and tables showing this conversion should be eliminated from Bulletin 107, Revised. It would, however, probably be useful to have available a correct table giving values of degrees Baumé in specific gravity, and Tables Nos. 11 and 12 of Bureau of Standards Circular 19 are the American official tables for this purpose.

BAKING POWDER.

It is recommended—

(1) That the kind and strength of acid used in determining carbon dioxid in baking powders be further studied.

Carried.

FLAVORING EXTRACTS.

It is recommended—

(1) That the method of determining vanillin and normal lead number in one weighed portion be studied next year.

Carried.

This process, as proposed by Winton and Lott, is described in the proceedings of the association for 1909 (Bulletin No. 132, p. 110). Since that time Winton and Berry have found that the amount of lead precipitated is materially affected by the time of standing, after adding the standard lead acetate solution, and the temperature of the solution during this standing. After numerous experiments they recommend standing eighteen hours (overnight) at 37°–40° C. The desired temperature can be secured by keeping the solutions contained in the 100 cc flasks in a bacteriological incubator or in a water bath provided with a constant temperature regulator. Proceeding in this manner, they find that the minimum normal lead number for extracts prepared according to the U. S. P. is 0.40.

(2) That the following text be substituted for all matter under the heading of "4. Determination and identification of vanillin, coumarin, and acetanilid," Bulletin 107, Revised, pages 156 to 158.

Carried.

The method as follows therefore becomes the provisional method for these determinations:

4. Determination and Identification of Vanillin and Coumarin.

MODIFIED HESS AND PRESCOTT METHOD FOR VANILLIN AND COUMARIN.

Weigh 50 grams of the extract directly into a tared 250 cc beaker with marks showing volumes of 80 and 50 cc, dilute to 80 cc, and evaporate to 50 cc in a water bath kept at 70° C. Dilute again to 80 cc with water and evaporate to 50 cc. Transfer to a 100 cc flask, rinsing the beaker with hot water, add 25 cc of standard lead acetate solution (80 grams of normal lead acetate made up to 1 liter), make up to the mark with water, shake, and allow to stand overnight. Decant onto a small dry filter and pipette off 50 cc and extract.

Extract by shaking four times in a separatory funnel, using 15 cc of ether each time. Wash the combined ether solutions four or five times with a 2 per cent ammonium hydroxid, using 10 cc the first time and 5 cc thereafter. Slightly acidulate the combined ammoniacal solutions with hydrochloric acid, cool and extract in a separatory funnel with four portions of ether, using about 40 cc altogether. Evaporate the ethereal solutions at room temperature, dry over sulphuric acid, and weigh.

If the residue is discolored or gummy, reextract in the dry state with boiling petroleum ether (b. p. 40° C. or below) not less than fifteen times, evaporate the solvent, dry and weigh. The residue should now be white, crystalline vanillin, with a melting point of approximately 80° C. A small amount of this residue dissolved in two drops of concentrated hydrochloric acid upon the addition of a crystal of resorcin should develop a pink color.

The original ether extract of the sample after removal of the vanillin with ammonium hydroxid is evaporated at room temperature and dried over sulphuric acid. The residue, if pure coumarin, should melt at approximately 67° C. and should respond to Leach's test for coumarin as follows: A small portion of the residue dissolved in hot water and filtered should develop a brown precipitate upon the addition of a few drops of tenth-normal iodin in potassium iodid. This precipitate finally gathers in green flecks, leaving a clear brown solution. The reaction is especially marked if the reagent is applied with a glass rod to a few drops of the solution on a white plate or tile.

(2) That the word "basic" under 11 (*b*), third line, Bulletin 107, Revised, page 159, be omitted.

Carried.

(3) That Woodman and Newhall's test for caramel be further investigated.

Carried. This method reads as follows:

11. Test for Coloring Matter (Caramel).

(c) WOODMAN AND NEWHALL'S METHOD.

Mix 15 cc of the extract with 2 cc of a 5 per cent solution of zinc chlorid, add 2 cc of 2 per cent potassium hydroxid solution and filter. Wash the precipitate with hot water, dissolve in 15 cc of 10 per cent hot acetic acid, neutralize, concentrate the filtrate to one-half its original volume and divide into two parts. To one part add three parts of paraldehyde and enough alcohol to render homogeneous; to the other add an equal amount of a mixture of two parts phenyl hydrazin hydrochlorid, three parts sodium acetate and 20 parts of water. After standing overnight both solutions will develop a brown flocculent precipitate if caramel is present.

(4) That the headings "Lemon extract," and "4. Lemon oil," on pages 159 and 160, Bulletin 107, Revised, be changed to read "Lemon and orange extracts" and "4. Lemon and orange oils."

Carried.

(5) That the following text be substituted for "(*a*) By polarization (Mitchell)," page 160, Bulletin 107, Revised.

Carried. The method reads as follows:

Polarize the extract at 20° C. without dilution in a 200 mm tube. Divide the reading in degrees Venske by 3.2 in the case of lemon extract and by 5.2 in the case of orange extract; in the absence of other optically active substances, the result will be the percentage of oil by volume. A small amount of cane sugar is occasionally present; if so, determine it as directed under "Sucrose" and correct the reading accordingly.

(6) That the last sentence under "(*b*) By precipitation," on page 160, be omitted.

Carried.

(7) That the paragraph headed "5. Refraction of precipitated oil," page 160, be omitted.

Carried.

(8) That the heading of the provisional method "Determination of citral in lemon extract," adopted in 1908 (see Bul. 122, p. 32, or Cir. 43, p. 10), be changed to read: "Determination of total aldehydes in lemon and orange extracts."

Carried.

(9) That the Hiltner method for the determination of citral in lemon and orange extracts be adopted as provisional.

Carried. (See Bul. 132, p. 102, for statement of method.)

(10) That the following be inserted as a provisional method under "10. Detection of coloring matter," page 161:

10. Detection of Coloring Matter.

(a) lemon and orange peel color (albrech).

Place a few cubic centimeters of the extract in a test tube and add slowly three or four volumes of concentrated hydrochloric acid. Place a few cubic centimeters of the extract in a second tube and add several drops of concentrated ammonium hydroxid. In the presence of lemon or orange peel color, the yellow tint of the original extract will be materially deepened in both cases.

(b) turmeric.

Evaporate 25 to 50 cc of the extract upon a small piece of filter paper, dry at low temperature, and moisten with a weak solution of boric acid containing a small amount of hydrochloric acid. Upon drying a second time a cherry-red color changing to green when spotted with ammonium hydroxid develops in the presence of turmeric.

(11) That the following methods for the examination of lemon and orange oils be provisionally adopted.

Carried. These methods are to be found in Bulletin 132, page 108, the only change being that under "Section 3, Rotation," the last two sentences are omitted and the following substituted: "—but readings may be obtained by the use of standard laevo-reading quartz plates." In addition substitute the following:

4. Determination of Citral.

(a) kleber's method.

Reagents.—Phenyl hydrazin: A 10 per cent solution of the purified chemical in absolute alcohol. A sufficiently pure product can be obtained by rectification of the commercial article, rejecting the first portions coming over which contain ammonia.

Hydrochloric acid: A half-normal solution.

Manipulation.—Weigh 15 grams of the sample into a small glass-stoppered flask, add 10 cc of the phenyl hydrazin solution. After allowing to stand for half an hour at room temperature, titrate with half-normal hydrochloric acid, using either methyl or ethyl orange as indicator. Titrate 10 cc of the phenyl hydrazin reagent in the same manner. The difference in cubic centimeters of half-normal acid, between this titration and that of the sample, multiplied by the factor 0.076, gives the weight of citral in the sample.

If difficulty is experienced in detecting the end point of the reaction, carry the titration out until the solution is distinctly acid, transfer to a separatory funnel, and draw off the alcoholic portion. Wash the oil with water, adding the washings to the alcoholic solution, and titrate back with half-normal alkali, making the necessary corrections.

(b) hiltner's method.

Proceed as directed under lemon and orange extracts, weighing 2 grams of the oil, diluting to 100 cc, and using 2 cc of this solution for the comparison.

5. Determination of Total Aldehydes.

Proceed as directed under lemon and orange extracts, using from 2 to 5 grams of the sample in 100 cc of aldehyde-free alcohol. This method should be used on orange oils the aldehydes of which are not determined by the other methods, although valuable information as to the content of added citral in the oil can be obtained by use of the Hiltner method.

(12) That the following methods for the examination of almond extract be provisionally adopted.

Carried. These methods read as follows:

ALMOND EXTRACT.

1. DETERMINATION OF ALCOHOL.

As almond extract does not usually contain other substances than oil of almonds and this oil only to the extent of 1 per cent, the alcohol can in most cases be calculated from the specific gravity of the extract. If the extract is high in solids, determine the alcohol as follows: Add 25 cc of the extract to 75 cc of a saturated solution of sodium chlorid in a separatory funnel and extract twice with separate 50 cc portions of petroleum ether (b. p. 40° to 60°). Collect the petroleum ether extract in a second separatory funnel and wash twice with two separate 25 cc portions of saturated brine. Combine the original salt solution with the washings, add a little powdered pumice, and distil into a 100 cc flask. When almost 100 cc have been distilled, make up to mark at room temperature and determine alcohol from the specific gravity. If preferred, a 50 per cent solution of calcium chlorid may be used in place of the saturated brine in this method.

2. DETERMINATION OF BENZALDEHYDE (DENIS AND DUNBAR).

Reagent.—Add 1.5 cc of glacial acetic acid to 20 cc of water and mix with 1 cc of phenyl hydrazin.

Manipulation.—Measure out two portions of 10 cc each of the extract into 300 cc Erlenmeyer flasks and add 10 cc of the reagent to one flask and 15 cc to the other. Allow to stand in a dark place overnight, add 200 cc of distilled water and filter on a tared gooch crucible provided with a thin coat of asbestos. Wash first with cold water, finally with 10 cc of 10 per cent alcohol, and dry for three hours in a vacuum oven at 70° C., or to constant weight over sulphuric acid. The weight of the precipitate multiplied by the factor 5.408, will give the weight of benzaldehyde in 100 cc of the sample. If duplicate determinations do not agree, repeat the operations, using a larger quantity of the reagent.

3. DETECTION OF HYDROCYANIC ACID.

Add several drops of ferrous sulphate and a single drop of ferric chlorid to several cubic centimeters of the extract. Mix thoroughly, add sodium hydroxid, drop by drop, until no further precipitate forms and finally dilute hydrochloric acid in sufficient amount to dissolve the precipitate. In the presence of even small amounts of hydrocyanic acid, a Prussian blue coloration will develop.

4. DETERMINATION OF HYDROCYANIC ACID IN THE ABSENCE OF CHLORIDS.

Measure into a small flask 25 cc of the extract and add 5 cc of freshly precipitated magnesium hydroxid (chlorin free). Titrate with tenth-normal silver nitrate solution, using potassium chromate as an indicator; 1 cc of tenth-normal silver nitrate is equal to 0.00268 gram hydrocyanic acid.

5. DETECTION OF NITROBENZOL.

Boil a few cubic centimeters of the extract with some zinc dust and acetic acid and filter. Add to the filtrate a drop of chloroform; make strongly alkaline with sodium hydroxid and heat. Where nitrobenol was present in the original extract, the characteristic odor of phenyl isonitrile will develop.

(13) That the following methods for the examination of cassia, cinnamon, and clove extracts be provisionally adopted:

Carried. These methods read as follows:

CASSIA, CINNAMON, AND CLOVE EXTRACTS.

1. ALCOHOL.

Determine as directed under Almond Extract.

2. OIL (HORTVET AND WEST METHOD).

Transfer 10 cc of the extract to a separatory funnel, add 30 cc of water, acidify with 1 cc of 1: 1 hydrochloric acid and extract three times with ether, using not less than 100 cc altogether. Wash the ether solution twice with water, and in the case of cinnamon extract dry by shaking with a small amount of granulated calcium chlorid. Transfer to a wide-mouth tared weighing bottle and evaporate the ether as rapidly as possible on a boiling water bath, rotating the liquid upon the sides of the flask in order to rid the residual oil of traces of ether. Weigh the residue and divide the weight by the specific gravity of the oil in order to obtain the volume; cassia by 1.05, cinnamon by 1.03, clove by 1.055. In the case of clove oil, allow the weighing bottle to remain upon the balance until the usual film of moisture has evaporated; the time of weighing should not be delayed over three minutes, however.

Determine the refractive index of the residual oils at 20° C. The refractive index of cassia oil at this temperature is from 1.585 to 1.60, of cinnamon from 1.590 to 1.599, and of clove from 1.560 to 1.565.

Dissolve a drop of the oil in several drops of alcohol, and add a drop of ferric chlorid solution. Cassia oil develops a green, cinnamon a brown, and clove a deep blue coloration.

(14) That the following methods for the examination of ginger extract be adopted as provisional.

Carried. These methods are as follows:

GINGER EXTRACT.

1. ALCOHOL.

Determine as directed under Vanilla Extract.

2. SOLIDS.

Evaporate 10 cc of the extract nearly to dryness on a water bath, dry for two hours in a water oven and weigh.

3. TEST FOR GINGER (SEEKER).

Dilute 10 cc of the extract to 30 cc, evaporate off 20 cc, decant into separatory funnel, and extract with an equal volume of ether. Evaporate the ether spontaneously in a porcelain dish and to the residue add 5 cc of 75 per cent sulphuric acid and about 5 mg of vanillin. Allow to stand for fifteen minutes and add an equal volume of water; in the presence of ginger extract an azure blue color develops.

(15) That the following tests for the detection of capsicum in ginger extract be further studied.

Carried. These tests are as follows:

4. TESTS FOR CAPSICUM (LA WALL-NELSON METHOD).

Dealcoholize 20 cc of the extract as directed under vanilla, extract with ether, and divide the ether extract into two parts. Transfer one part to a test tube, evaporate to dryness, and add 5 cc of alcoholic potash, heating for half an hour in a boiling-water bath under a reflux cooler. Evaporate to dryness, take up the residue in water, and extract with ether. Evaporate the ether to dryness and test the residue by taste. To the second part of the original ether extract add 10 cc of alcoholic potash, evaporate to dryness in a porcelain dish, and add 0.1 gram of manganese dioxid. Dilute with 10 cc of water, heat for twenty minutes on a water bath, cool, and extract with petroleum ether. Evaporate the petroleum ether, heat for five minutes to expel volatile oils, and test for capsicum by taste.

(16) That methods for the examination of nutmeg and wintergreen extracts be further studied.

Carried.

(17) That the Howard method for the examination of peppermint extract be adopted as provisional.

Carried. This method reads as follows:

PEPPERMINT EXTRACT.

(1) ALCOHOL.

Determine as directed under Almond Extract.

(2) PEPPERMINT OIL.

Pipette 10 cc of the extract into a Babcock milk bottle and add 25 cc of cold water, 1 cc of cold hydrochloric acid, specific gravity of 1.2, and 0.5 cc of chloroform. Close the mouth of the bottle with the thumb and shake vigorously for not less than one minute. Whirl the bottle in a centrifuge for two minutes and remove all but 3 or 4 cc of the clear supernatant liquid by means of a glass tube of small bore and aspiration. To the residue add 1 cc of ether, agitate thoroughly, plunge the bottle to the neck in boiling water, holding at a slight angle, and rotate in the bath exactly one minute. Cool, fill the bottle to the neck with water at room temperature, centrifuge, and read the volume of the separated oil from the top of the meniscus, and multiply the reading by 2 to obtain the per cent of oil by volume.

REPORTS OF COMMITTEES.

STANDARDIZATION OF ALCOHOL TABLES.

Mr. Tolman, on behalf of this committee, recommended that the alcohol tables of the Bureau of Standards, as ordered printed in Circular 52 of the Bureau of Chemistry (see p. 22) in 1909, be adopted as provisional, pending further consideration of the question in connection with the work of the committee on the revision of the Pharmacopœia.

Adopted.

COMPILATION OF BY-LAWS OF THE ASSOCIATION.

Mr. Bigelow, as chairman of this committee, submitted seven by-laws, which were adopted by the association. They read as follows:

REPORT OF COMMITTEE ON BY-LAWS.

(1) Any amendment to these by-laws or addition thereto may be proposed at a meeting of the association and shall then be published in the Proceedings. It may then be adopted by a majority vote of the association at the next meeting.

(2) These by-laws or any portion of them may he suspended without previous notice by an unanimous vote of those present at any meeting of the association.

(3) There shall be a committee of nine members, which shall be designated as the Committee on Recommendations of Referees. The president shall appoint three members of this committee to serve six years, such appointments to be made every other year, as the terms expire. The chairman of the committee shall be appointed by the president and shall divide the nine members into three subcommittees (A, B, and C), and shall assign to each subcommittee the reports and subjects it shall consider.

(4) Each referee shall forward to the chairman of the Committee on Recommendations at least three weeks before the meeting of the association his recommendations and a sufficient abstract of his report to enable the committee to act intelligently on the recommendations.

(5) A method shall not be adopted as provisional or a provisional method amended until such method or amendment has been reported by the appropriate referee and published in the Proceedings of the association.

(6) A method shall not be adopted as official or an official method amended until such method or amendment has been recommended as official for at least two years by the appropriate referee.

(7) Each college, experiment station, bureau, board, or other institution entitled to representation in the association shall contribute annually $2, and its representatives shall not be qualified to vote or hold office in the association unless such annual dues have been paid, but these shall not be cumulative.

W. D. Bigelow, *Chairman.*
C. L. Penny.
R. N. Brackett.

AMENDMENTS TO THE CONSTITUTION.

Mr. Van Slyke, on behalf of the committee, reported favorably on the two amendments to sections 1 and 2, respectively, submitted in 1909, and printed on page 19 of Circular 52, and these amendments were adopted by the association. Another recommendation made by the committee was referred to conference with the Committee on By-laws and will be found incorporated in the latter report.

APPOINTMENT OF NEW COMMITTEES.

During the year the Executive Committee had appointed a committee to represent the association at a conference called by the Society for the Promotion of Agricultural Science to meet in November, 1910, and consider the cooperation of the various agricultural organizations. This committee consisted of H. W. Wiley and W. D. Bigelow, of Washington, D. C., and F. W. Woll, of Madison, Wis. The association approved of the appointment of this committee, with the proviso that it should act solely in an advisory capacity without binding the association to any action. Mr. C. B. Williams was appointed to act in the place of Mr. Woll, who was not able to attend the conference.

A resolution was passed empowering the president to appoint a committee of three or five members to confer with other committees having in charge the arrangements for the Eighth International Congress of Applied Chemistry, to be held in this country in 1912. (See p. 26 for personnel.)

OFFICERS, REFEREES, AND COMMITTEES OF THE ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS, 1910-1911.

President.

F. W. Woll, Madison, Wis.

Vice-President.

H. J. Patterson, College Park, Md.

Secretary.

H. W. Wiley, Washington, D. C.

Additional members of the Executive Committee.

H. C. Lythgoe, Boston, Mass.
P. F. Trowbridge, Columbia, Mo.

Referees.

Phosphoric acid: H. D. Haskins, Amherst, Mass.
Nitrogen:
  Determination of nitrogen: J. W. Kellogg, Harrisburg, Pa.
  Separation of nitrogenous bodies (meat proteids): C. R. Moulton, Columbia, Mo.
Potash: E. L. Baker, Geneva, N. Y.
Soils: J. G. Lipman, New Brunswick, N. J.
Dairy products: G. W. Cavanaugh, Ithaca, N. Y.
Foods and feeding stuffs: G. M. MacNider, Raleigh, N. C.
Food adulteration: A. S. Mitchell, St. Paul, Minn.
Sugar: H. P. Agee, Audubon Park, New Orleans, La.
Tannin: J. S. Rogers, Washington, D. C.
Insecticides: C. C. McDonnell, Washington, D. C.
Inorganic plant constituents: O. M. Shedd, Lexington, Ky.
Medicinal plants and drugs: L. F. Kebler, Washington, D. C.
Water: W. W. Skinner, Washington, D. C.

Associate referees.

Phosphoric acid: A. J. Patten, East Lansing, Mich.
Nitrogen:
  Determination of nitrogen: F. Thompson, Newark, Del.
  Separation of nitrogenous bodies—
    Milk and cheese: A. W. Bosworth, Geneva, N. Y.
    Vegetable proteids: R. Harcourt, Guelph, Canada.
Potash:
  Determination: T. Bragg, Auburn, Ala.
  Availability: H. H. Hill, Blacksburg, Va.
Soils: G. S. Fraps, College Station, Tex.
Dairy products: E. M. Bailey, New Haven, Conn.
Foods and feeding stuffs: E. V. McCollum, Madison, Wis.
Food adulteration:
  Colors: W. E. Mathewson, New York, N. Y.
  Saccharine products: S. H. Ross, Omaha, Nebr.
  Fruit products: A. W. Blair, Gainesville, Fla.
  Wine: E. J. Lea, Berkeley, Cal.
  Beer: W. D. McAbee, Indianapolis, Ind.
  Distilled liquors: J. O. La Bach, Lexington, Ky.
  Vinegar: W. A. Bender, New York, N. Y.
  Flavoring extracts: R. S. Hiltner, Denver, Colo.
  Spices: R. W. Hilts, Philadelphia, Pa.
  Baking powder: E. W. Magruder, Richmond, Va.
  Meat and fish: Ralph Hoagland, St. Paul, Minn.
  Fats and oils: H. S. Bailey, Washington, D. C.
  Dairy products: A. E. Paul, Chicago, Ill.
  Cereal products: W. M. Allen, Raleigh, N. C.
  Vegetables: J. P. Street, New Haven, Conn.
  Condiments other than spices: W. J. McGee, New Orleans, La.
  Cocoa and cocoa products: W. L. Dubois, Buffalo, N. Y.
  Tea and coffee: M. E. Jaffa, Berkeley, Cal.
  Preservatives: H. E. Barnard, Indianapolis, Ind.
  Water in foods: H. C. Lythgoe, Boston, Mass.
  Organic and inorganic phosphorus in foods: H. S. Grindley, Urbana, Ill.
Sugar: C. S. Hudson, Washington, D. C.
Insecticides: S. D. Averitt, Lexington, Ky.
Medicinal plants and drugs:
  Synthetic products: W. O. Emery, Washington, D. C.
  Medicated soft drinks: H. C. Fuller, Washington, D. C.
  Medicinal plants: Albert Schneider, San Francisco, Cal., and H. H. Rusby, New York, N. Y.
Water: C. E. Bradley, Corvallis, Oreg.
Tannin: Burton Ray, West Raleigh, N. C.
Inorganic plant constituents: W. H. McIntire, State College, Pa.

SPECIAL COMMITTEES.

Amendments to the Constitution.

L. L. Van Slyke, Geneva, N. Y., chairman.
B. B. Ross, Auburn, Ala.
William Frear, State College, Pa.

Appropriation.

John Phillips Street, New Haven, Conn., chairman.
R. J. Davidson, Blacksburg, Va.
H. E. Barnard, Indianapolis, Ind.

Availability of Phosphoric Acid in Basic Slag.

W. F. Hand, Agricultural College, Miss., chairman.
C. B. Williams, West Raleigh, N. C.
C. G. Hopkins, Urbana, Ill.
H. D. Haskins, Amherst, Mass.
John S. Burd, Berkeley, Cal.

Cooperation with Other Agricultural Organizations.

[At request of Society for the Promotion of Agricultural Science.]

H. W. Wiley, Washington, D. C.
W. D. Bigelow, Washington, D. C.
F. W. Woll, Madison, Wis. (alternate, C. B. Williams, West Raleigh, N. C.).

Food standards.

William Frear, State College, Pa., chairman.
H. W. Wiley, Washington, D. C.
H. A. Weber, Columbus, Ohio.
M. A. Scovell, Lexington, Ky.
E. H. Jenkins, New Haven, Conn.

Journal of Agricultural Research.

W. A. Withers, Raleigh, N. C., chairman.
H. W. Wiley, Washington, D. C.
C. G. Hopkins, Urbana, Ill.
M. E. Jaffa, Berkeley, Cal.
(Fifth member to be appointed.)

Participation in the Eighth International Congress of Applied Chemistry.

J. P. Street, New Haven, Conn., chairman.
F. K. Cameron, Washington, D. C.
R. Harcourt, Guelph, Canada.
J. G. Lipman, New Brunswick, N. J.
R. W. Thatcher, Pullman, Wash.

Presentation of the Question of Unification of Terms to the International Congress of Applied Chemistry.

R. J. Davidson, Blacksburg, Va., chairman.
C. G. Hopkins, Urbana, Ill.
W. D. Bigelow, Washington, D. C.
G. S. Fraps, College Station, Tex.
B. W. Kilgore, Raleigh, N. C.
H. J. Wheeler, Kingston, R. I.
J. T. Willard, Manhattan, Kans.

Recommendation of Referees and Revision of Methods.

[Figures in parentheses refer to year in which appointment expires.]

A. L. Winton, chairman.

Subcommittee A: W. W. Skinner (1916), B. B. Ross (1914), *J. P. Street (1912), chairman, Agricultural Experiment Station, New Haven, Conn.*

Subcommittee B: H. E. Barnard (1916), *E. M. Chace (1914), chairman, Bureau of Chemistry, U. S. Department of Agriculture, Washington, D. C.*, J. M. Bartlett (1912).

Subcommittee C: P. F. Trowbridge (1916), C. D. Howard (1914), *A. L. Winton (1912), chairman, U. S. Food and Drug Inspection Laboratory, Chicago, Ill.*

Standardization of Alcohol Tables.

L. M. Tolman, Washington, D. C., chairman.
M. E. Jaffa, Berkeley, Cal.
A. B. Adams, Washington, D. C.
R. J. Davidson, Blacksburg, Va.
H. E. Barnard, Indianapolis, Ind.

Testing of Chemical Reagents.

L. F. Kebler, Washington, D. C., chairman.
A. L. Winton, Chicago, Ill.
B. W. Kilgore, Raleigh, N. C.

Unification of Methods of Analysis of Fats and Oils.

L. M. Tolman, Washington, D. C., chairman.
P. H. Walker, Washington, D. C.
A. Lowenstein, Chicago, Ill.

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